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The Science of Monster Hunting

Abstract

Cryptozoology is a controversial discipline – often listed among the so-called pseudo-sciences – dedicated to the study of animal species whose existence is not supported by solid empirical evidence. Despite being characterised by a general lack of method, this paper will examine some aspects of cryptozoology that were developed and successfully used in the context of biological science. In a time characterized by ever-increasing loss of biodiversity, complex social relationships, and human-wildlife conflict, an interdisciplinary approach is an essential tool for conservation and a scientific approach to cryptozoology would bring about a beneficial contribution to the process.

Riassunto

La Scienza della caccia ai mostri. *La criptozoologia è una controversa disciplina, spesso annoverata tra le cosiddette pseudoscienze, dedita allo studio di specie animali la cui esistenza non è supportata da solide prove empiriche. Nonostante sia caratterizzata da una generale mancanza di metodo, prenderemo qui in esame alcuni suoi aspetti elaborati e utilizzati con successo nell'ambito delle scienze biologiche. In un'epoca caratterizzata da una sempre maggiore perdita di biodiversità, complessi rapporti sociali e conflitti tra uomo e fauna, in cui l'interdisciplinarietà è uno strumento ormai indispensabile per la conservazione, un approccio scientifico alla criptozoologia potrebbe essere incluso in questo processo arrecando benefici.*

Keywords: *Cryptozoology, ethnozoology, conservation, biodiversity, pseudo-sciences*

Parole chiave: *Criptozoologia, etnozoologia, conservazione, biodiversità, pseudoscienze*

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1. Introduction

In recent years, there has been a growing awareness that biodiversity conservation can no longer be pursued just from the perspective of biological sciences (cf. Alves & Albuquerque, 2018). Literature adopting this approach has not just considered the more "traditional" ethical, political and social aspects, but has also explored fields that could be considered "unconventional" (see Loxdale *et al*., 2016; Watson & Davis, 2017; Holmes *et al*., 2018) and proposed multidisciplinary strategies for the most particular cases, such as the conservation of species that have become so rare that they are considered extinct by some (Black, 2020).

The attempt by French-Belgian zoologist Bernard Heuvelmans (1916-2001) to establish a branch of zoology named cryptozoology, can perhaps be considered the most ambitious effort in this sense in the modern era.

Heuvelmans defined cryptozoology as:

«*The scientific study of hidden animals, i.e., of still unknown animal forms about which only testimonial and circumstantial evidence is available, or material evidence is considered insufficient by some*» (Heuvelmans, 1988).

Although generally regarded by critics as a pseudoscience, devoted to monsters and zoologically improbable creatures (e.g. Simpson, 1984; Loxton & Prothero, 2013), one of Heuvelmans' ideas on the usefulness and necessity of cryptozoology was that it would help conservation of animal species and populations by "accelerating" the processes underlying their discovery and description, because only what is scientifically recognized can benefit from scientific research and study. An in-depth review of the discipline, its history, major criticism received in academia, and its current status was the subject of a previous paper (see Rossi, 2016). The aim of this work is to examine some aspects of cryptozoology and how Heuvelmans' ideas "anticipated" concepts, independently elaborated and explored by other authors, and were subsequently addressed in science.

2. From "Lazarus species" to "unknown knowns"

One of the zoological categories that Heuvelmans indicated as the object of study of cryptozoology concerned taxa that were considered extinct and whose possible survival was unknown to science: «*For instance, it would include […] animals which are well-known, but not known to live now*» (Greenwell, 1984).

At the time, Heuvelmans was inspired by the discovery of the West Indian Ocean coelacanth (*Latimeria chalumnae*), a present-day species of the order Coelacanthiformes (Fig. 1), previously considered extinct for 65 million years and discovered alive in 1938 (Smith, 1939), and of the Chacoan peccary (*Catagonus wagneri*), known by the natives of Gran Chaco as *curé-buro* and

discovered in 1972, but previously known only from fossil specimens and believed to have become extinct 20,000 years ago (Wetzel *et al.*, 1975).

Fig. 1 – *Stuffed specimen of coelacanth* Latimeria chalumnae *Smith, 1939 (Natural History Museum, Vienna).*

In an attempt to summarize Heuvelmans' ideas, that appeared disjointedly in the most disparate types of publications and in different languages (see Rossi, 2016), Greenwell identified categories of animals relevant to cryptozoology, including:

"Category IV: Known taxa which supposedly became extinct during historical times, but which may have survived far longer than originally believed, or may have survived to the present" (Greenwell, 1985).

"Category V: Representatives of fossil forms believed to have become extinct during geological times, but which may have survived into historical times, or even to the present" (Greenwell, 1985).

In the same years, the concept "Lazarus effect" was coined (Flessa & Jablonski, 1983; Jablonski, 1986) and subsequently explored in Palaeontology, as a term that indicated the reappearance of taxa after long periods of apparent absence from the fossil record. Later this concept was extended by referring to the discovery in life of taxa considered extinct as "very special cases of the Lazarus effect" (Dawson *et al.*, 2006).

The most emblematic case of this is the Laotian rock rat (*Laonastes aenigmamus*), a rodent of the family Diatomyidae (Fig. 2), previously considered extinct for 11 million years, found living in the Khammouan region in Laos (Jenkins *et al.*, 2005).

The term "Lazarus effect" is now commonly used in biology to indicate the survival of any taxon considered extinct but then "reappeared", regardless of the lapse of time. The cases in literature are numerous: a review counted 351 in the last 122 years (Scheffers *et al.*, 2011) and new ones can be listed since that publication (e.g. Demaya *et al.*, 2019; Fisher & Fisher, 2021).

Fig. 2 – *Laotian rock rat* Laonastes aenigmamus *Jenkins, Kilpatrick, Robinson & Timmins, 2005 (after Wikimedia Commons, public domain)*.

The importance of the study of "Lazarus species" for conservation was addressed by Collar (1998) when he coined the term "Romeo error". This concept indicates that conservation biologists must not prematurely presume a species extinct, thus causing the termination of any attempt to safeguard it. The author drew inspiration from the case of the island of Cebu (Philippines), historically affected by the problem of deforestation and from which 2 species and 8 endemic subspecies of birds were thought to have almost completely disappeared as early as the beginning of 1900 (McGregor, 1907). At the end of the 1950s, there seemed to be no more original forest patches (Rabor, 1959) and so by the 1960s Cebu was ignored by biologists. Then, in 1992 birdwatcher and ornithologist R.J. Timmins went to the island and managed to locate the small patch of forest now known as "Tabunan", in which he identified 4 of the 10 "lost taxa" (Dutson *et al.*, 1993). Paradoxically, this patch lies in an area that had been declared protected as early as 1936 (Cebu National Park), but that had remained a "paper park" and only recently is being effectively protected and valued, thanks to Timmins' discovery.

This is not an isolated case, since determining the extinction of a species can be extraordinarily difficult (see Jarić & Roberts, 2014) even when it concerns large animals that should presumably be easier to identify. For example the Caspian tiger (*Panthera tigris virgata*), declared extinct in the early 1970s but probably present in Turkey until the 1990s (Can, 2004) and the Barbary lion

(*Panthera leo leo*), considered extinct since 1958, but probably still present in the early 1960s in Algeria and Morocco (Black *et al.*, 2013). In both cases, due to the assumption of extinction, it was not possible to do anything to protect what remained of the populations.

Usually, when a population reaches very low numbers – thus becoming rare and difficult to observe – information on their possible presence can be difficult to assess and is often considered unreliable by zoologists. The tendency to spot animals that presumably no longer exist has been defined "Thylacine effect" (MacPhee & Flemming, 1999), from the well-known species of marsupial carnivore (*Thylacinus cynocephalus*) considered extinct in recent times in Tasmania (Fig. 3). Now, not a year goes by without sightings being recorded both in Tasmania and in mainland Australia (Smith, 1981; Heberle, 2004), although objective evidence is totally lacking.

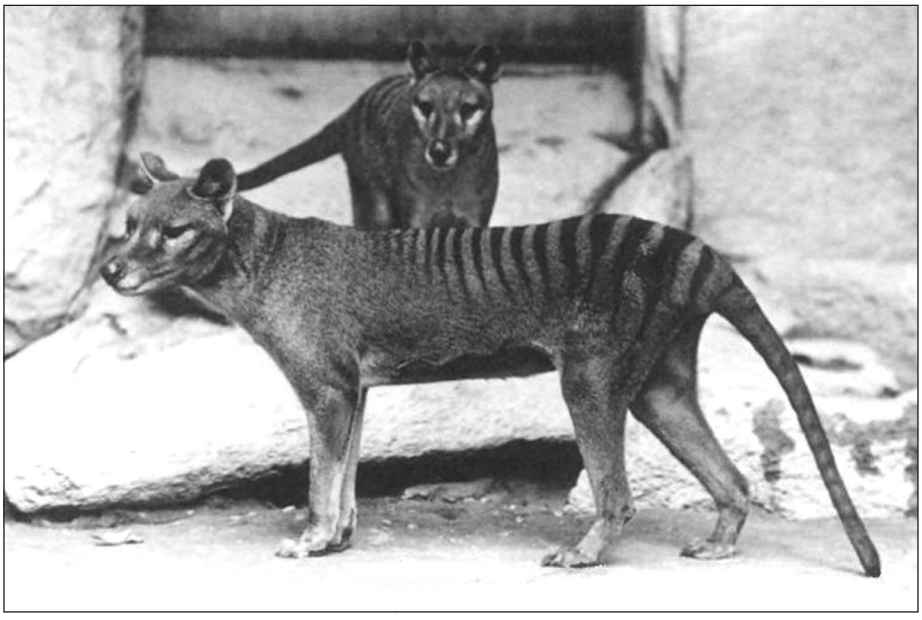

Fig. 3 – *Couple of thylacines* Thylacinus cynocephalus *Harris, 1808 (Hobart Zoo, photo 1921). The last specimen – a male named Benjamin – died in captivity in 1936.*

Watson & Davis (2017), however, stressed how too sceptical an attitude from academia means that often the news of expeditions in search of species considered extinct are treated with disdain, often damaging the reputation of those who lead them. As a result, it becomes very difficult to obtain funds for this type of research, which is often carried out by passionate naturalists in their

spare time. Yet, conservation can benefit from such research even when the species under investigation is not found. For example, the so-called umbrella protection can involve entire ecosystems associated with a "lost species", as in the case of the Ivory-billed Woodpecker (*Campephilus principalis*) (Fig. 4).

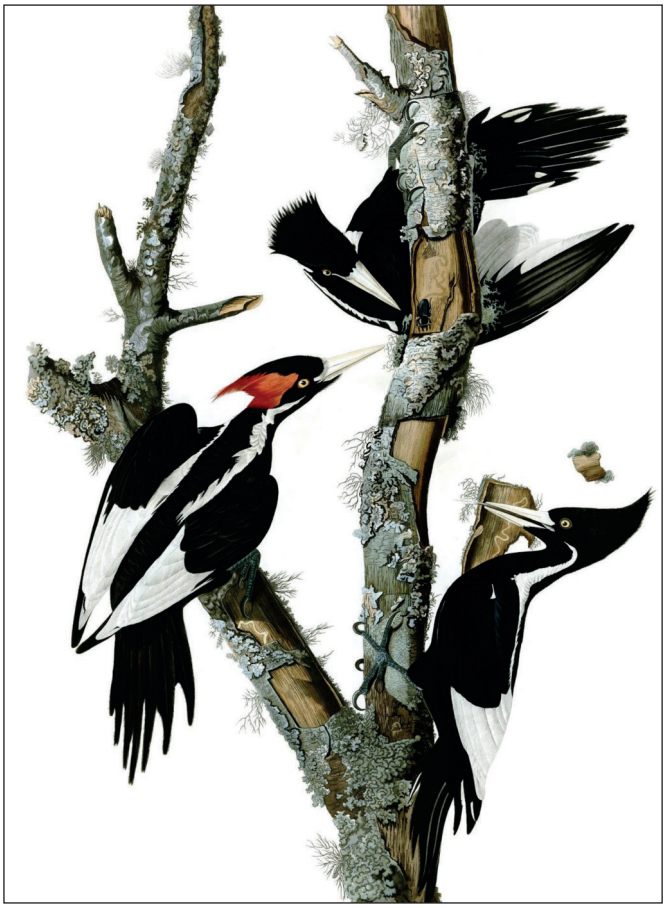

Fig. 4 – *Male (left) and female of ivory-billed woodpecker* Campephilus principalis *(painting by John James Audubon, circa 1830).*

Considered as potentially extinct throughout its range, since 2004 several reports seemed to indicate its survival (Fitzpatrick *et al*., 2005; Hill *et al*., 2006), which, despite the fact that it was never confirmed, allowed the establishment of a consortium for the management of the native forests of the northern Mississippi valley.

Finally, it is interesting to note how the concept of "category IV" inspired by Heuvelmans' work matches in many respects that of "unknown knowns" that Loxdale *et al.* (2016) derived from a knowledge-data framework based on the political-military statement by former US Secretary of Defence Donald Rumsfeld (https://archive.today/20180320091111/http://archive.defense.gov/Transcripts/Transcript.aspx?TranscriptID=2636): «*The unknown knowns, those species which we know did once exist, and assume are now extinct for whatever reason, but because of poor data, including observational and poor sampling, cannot prove one way or the other*».

3. Cryptozoology and Ethnozoology

One aspect addressed by Heuvelmans in his elaboration of cryptozoology is the importance of the role of native populations in guiding the discovery or rediscovery of animal species:

«*The science of hidden animals... more generally referred to as "unknowns", even though they are typically known to local populations – at least sufficiently so that we often indirectly know of their existence, and certain aspects of their appearance and behaviour*» (Heuvelmans, 1982).

«*They are, to put it briefly, native-known, or, if one wishes to use scientific jargon, ethnognostic. Therefore, more circumstantial evidence can be extracted by the cryptozoologist from ethnographical sources*» (Heuvelmans, 1988).

Although Heuvelmans cites ethnographic sources, he never mentions ethnozoology, a term coined in 1899 (Mason, 1899). Heuvelmans used the term cryptozoology for the first time in a publication in 1965, but its first appearance in literature is due to Blancou (1959) who dedicated one of his books to Heuvelmans calling him "the father of cryptozoology". Actually, Heuvelmans used this term before then in his numerous private correspondences, but it still seems strange that he was not aware of the word "ethnozoology". It is likely that its non-use was voluntary, perhaps because unlike ethnobotany, which developed with great success starting in 1895, ethnozoology was not taken into particular consideration for several years. Furthermore, Mason proposed it as a branch of zootechnology dedicated only to utilitarian aspects of animal species for local populations (Clément, 1998).

Henderson & Harrington (1914) later redefined it as "the study of existing cultures and their relationships with the animals in their surrounding environments". This allowed further developments of the discipline, which began to consider folkloric aspects as well (Sturtevant, 2013). However, among the different fields in which ethnozoology has evolved as reported by Alves *et al.* (2018), the debate on the existence of possible new species, on the survival of Lazarus species, or on known species in undocumented areas is still rather

neglected by ethnozoologists if not in some rare instances (Forth, 2017; Walsh & Goldman, 2017).

Zoologists have debated the scientific reliability of traditional ecological knowledge, but although it may be able to lead to new scientific discoveries (Johannes, 1981) they are generally reluctant to investigate these issues (Johannes, 1989; Cozzuol *et al.*, 2014). The major obstacle seems to be the need to use social science tools and the reluctance of researchers to collaborate with native populations (Huntington, 2000). On the other hand, even on those rare occasions when ethnozoologists approached cryptozoological matters, they seemed to overlook zoological sciences, leaning towards social and folkloric aspects only (e.g. Hurn, 2017). This lack of permeability on both sides makes cryptozoology a kind of "bridge" that biologist and sociologist of science Benoit Grison has defined as "a particular form of ethnozoology" (Grison, 2017).

4. The unexpected usefulness of fantastic animals

The aspect that prevented cryptozoology the most from being accepted as a branch of zoology was certainly the fact that it gained popularity among the public thanks to the fascination exercised by animals whose existence is, from a biological point of view, unlikely.

Although Heuvelmans himself had indicated the problem by pointing out that the animals studied in cryptozoology must have a 'certain implicit plausibility "and be "coherent with the most advanced scientific knowledge of our time "(Heuvelmans, 1987a), it is undeniable that most of his production is linked to unlikely animals such as presumed present-day African dinosaurs (Heuvelmans, 1978), Neanderthal men (Heuvelmans, 1974) and sabre-toothed cats (Heuvelmans, 2007).

It is also worth noting that the very concept of cryptozoology was inspired to him by his research on the fabulous "sea serpents", of which he did not hesitate to "scientifically" describe nine different species (Heuvelmans, 1965).

Heuvelmans understood the importance of the myths behind the identification of animals that turned out to be real (Heuvelmans, 1987b), but he was criticized for his tendency to reduce each myth to the existence of an unknown animal without considering other explanations (Groves, 1984; Conway *et al.*, 2013). Ironically, the oversimplification approach has recently been criticized also in relation to the sceptical approach towards "magical animals" due to the lack of knowledge in the relevant disciplines (Holmes *et al.*, 2018).

According to the authors, this lack of multidisciplinary vision prevents us from assessing the positive impact that fantastic animals (or fantastic attributes of real animals) can have on conservation. For example, in 2013

the construction of a highway in Iceland was stopped because it would have crossed the habitat of a "valued (albeit non-existent) species": the Huldufólk (The Guardian, 2013). Furthermore, in 2005 the Bhutanese government used a $ 700,000 funding to improve the conservation of the Sakteng Wildlife Sanctuary, a wildlife sanctuary created specifically to protect the habitat of the *migoi* (the local yeti) (Gordon, 2005).

Since they are not often debated in academia, cryptozoological issues are instead usually tackled by so-called "sceptics" or "debunkers", who often exasperate and misuse concepts such as Occam's razor by oversimplifying the explanation of a phenomenon, especially when lacking specific knowledge that they mistakenly think can be replaced with "critical attitude".

Despite the preference for simplicity being a legacy of 17th century theology and despite the scarceness of empirical evidence in favour of such an approach in science (Crick, 1988; Oreskes *et al.*, 1994), oversimplification has often been used to provide explanations in contrast to supposedly unscientific hypotheses, often with no effort to examine phenomena in their complexity.

This happened for example with the impressive amount of literature available about sea serpents in the period from 1800 to 1900 (Heuvelmans, 1965). Taking into consideration the famous case of the Gloucester sea snake, a large marine animal apparently endowed with numerous humps observed by hundreds of witnesses, Joe Nickell, using just the details extrapolated from a single sighting, ascribed the mysterious animal to a narwhal (*Monodon monoceros*) (Nickell, 2019). At the same time, an in-depth analysis by France (2019, 2020) showed how many of these sightings can be explained with marine animals trapped in nets, lines and rows of floating buoys, and thus allowed the pre-dating of the phenomenon of marine animals' entanglement with debris of human origin to a time before the advent of plastics.

Another emblematic case that calls for increased attention in the field of cryptozoology as a potential tool for conservation is that of the Zanzibar leopard. Once considered an endemic subspecies of Unguja (*Panthera pardus adersi*), the largest island in the Zanzibar archipelago, it was never scientifically studied in nature despite being the largest predator on the island. Its decline began in the mid-1900s with the large-scale transformation of the island's landscape (Walsh & Goldman, 2017). Despite the British protectorate declaring it a protected species, the natives continued to hunt it, both for its increasingly frequent habit of approaching human settlements (due to habitat destruction), and for a complex system of beliefs that identified "confidant" leopards with familiars instructed by witches to harm people (Walsh & Goldman, 2007). After the Zanzibar revolution in 1964, the new government launched an extermination campaign against the species which was declared extinct in the early 1970s.

Zoologists resumed their interest in the Zanzibar leopard only in the 1990s (Archer, 1994), reporting alleged sightings and reports that have never been confirmed to date (Walsh & Goldman, 2008). As an additional element typical of any self-respecting "mysterious animal" case, a video that allegedly portrays a specimen was obtained in 2018 by an Animal Planet crew during the making of a television programme, but the veracity of said footage remains very doubtful (see Rossi *et al.*, 2020).

It seems evident that more productive collaboration between all the parties involved, taking into account political aspects, conservation of the species, the role of local populations and their beliefs, the delay with which biologists studied the species in nature could have been reduced, the premature assumption of extinction could have been avoided and measures to prevent it could have been taken. By doing that, the history of this population of felids would have had a different ending.

5. Conclusions

For a long time "ghettoized" by the scientific community, "uncertain animals" have a relevance that only recently seems to have been acknowledged by those who are involved in conservation.

Because of a number of unresolved issues (see Rossi, 2016), cryptozoology may very well remain a discipline relegated between the indefinite borders that separate science and pseudoscience, but many of its concepts and methods have actually been successfully used on several occasions by zoologists (Adams & McCorristine, 2017).

With the current extinction rate, which also includes species not yet discovered and described (Giam *et al.*, 2012), the challenge for conservation has an absolute need for an increasingly "open" and interdisciplinary process that includes a scientific cryptozoological approach.

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